WHAT IS CLAIMED IS:

1. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said laser beam is a second harmonic component generated from a continuous-oscillate light source,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said laser beam in parallel with a carrier flow direction in said channel region.

2. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said linear laser beam is a second harmonic component generated from a continuous-oscillate light source,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said linear laser beam in parallel with a carrier flow direction in said channel region.

3. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said laser beam is a third harmonic component generated from a continuous-oscillate light source,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said laser beam in parallel with a carrier flow direction in said channel region.

4. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said linear laser beam is a third harmonic component generated from a continuous-oscillate light source,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said linear laser beam in parallel with a carrier flow direction in said channel region.

5. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said laser beam is a second harmonic component of a Nd:YAG laser,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said laser beam in parallel with a carrier flow direction in said channel region.

6. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said linear laser beam is a second harmonic component of a Nd:YAG laser,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said linear laser beam in parallel with a carrier flow direction in said channel region.

7. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said laser beam is a third harmonic component of a Nd:YAG laser,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said laser beam in parallel with a carrier flow direction in said channel region.

8. A method for manufacturing a semiconductor device having at least one thin film transistors, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer; and

forming source, drain and channel region of said thin film transistor within said semiconductor layer,

wherein said linear laser beam is a third harmonic component of a Nd:YAG laser,

wherein the irradiation of said semiconductor layer is conducted in such a manner that said semiconductor layer is scanned with said linear laser beam in parallel with a carrier flow direction in said channel region.

9. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate; and

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer, while moving said substrate in a direction approximately perpendicular to a lengthy direction of said linear laser beam,

wherein said linear laser beam is a second harmonic component generated from a continuous-oscillate light source.

10. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

patterning the crystallized semiconductor layer to form an active layer of said thin film transistor,

wherein said laser beam is a second harmonic component generated from a continuous-oscillate light source.

11. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate; and

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer, while moving

said substrate in a direction approximately perpendicular to a lengthy direction of said linear laser beam,

wherein said linear laser beam is a third harmonic component generated from a continuous-oscillate light source.

12. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

patterning the crystallized semiconductor layer to form an active layer of said thin film transistor,

wherein said laser beam is a third harmonic component generated from a continuous-oscillate light source.

13. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate; and

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer, while moving said substrate in a direction approximately perpendicular to a lengthy direction of said linear laser beam,

wherein said linear laser beam is a second harmonic component of a Nd:YAG laser.

14. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

patterning the crystallized semiconductor layer to form an active layer of said thin film transistor,

wherein said laser beam is a second harmonic component of a Nd:YAG laser.

15. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate; and

irradiating said semiconductor layer with a linear laser beam to crystallize said semiconductor layer, while moving said substrate in a direction approximately perpendicular to a lengthy direction of said linear laser beam,

wherein said linear laser beam is a third harmonic component of a Nd:YAG laser.

16. A method of manufacturing a semiconductor device having at least one thin film transistor, said method comprising the steps of:

forming a semiconductor layer over a substrate;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer; and

patterning the crystallized semiconductor layer to form an active layer of said thin film transistor,

wherein said laser beam is a thrid harmonic component of a Nd:YAG laser.

17. A method according to any one of claims 1 to 16, wherein said semiconductor layer comprises amorphous silicon.

18. A method according to any one of claims 1 to 16, wherein said semiconductor layer comprises silicon and germanium.

19. A method according to any one of claims 1 to 16, wherein the crystallized semiconductor layer contains carbon at a concentration not higher than $5x10^{18}$atoms/cm^3.

20. A method according to any one of claims 1 to 16, wherein the crystallized semiconductor layer contains oxygen at a concentration not higher than $5x10^{19}$atoms/cm^3.